REMARKS

Claims 1, 6, 43, 49, and 52-64 are pending. Claims 1 and 52-55 are rejected under 35 U.S.C. § 112, first and second paragraphs, and claim 1 is rejected under 35 U.S.C. § 102. Claims 43, 44, and 49 are withdrawn from consideration and claims 6 and 56-64 are allowed. Applicants note that the preliminary amendment filed on May 19, 2004 has not been entered and, therefore, the status of the claims under "AMENDMENTS TO THE CLAIMS" does not reflect any amendments set forth in the preliminary amendment. Instead, the status of the claims is based on the status after entry of the amendments set forth in Applicants' reply filed with the Request for Continued Examination on February 9, 2004. Applicants address each of the rejections as follows.

Claim amendments

Support for the amendments to claims 1 and 52-55 may be found, for example, at page 3, lines 13-15, and page 11, line 19, to page 12, line 11, of the specification. In addition, new claims 65 and 66 find support in original claims 1 and 6, respectively, as well as at page 3, lines 14 and 15, and at page 12, lines 12-20, of the specification. Recitation of the phrase "lacks pore-forming ability" in new claims 87, 98, and 109, and their dependent claims, also finds support, for example, at page 3, lines 14 and 15, and at page 12, lines 12-20, of the specification. The specific mutations recited in new claims 67-119, find support, for example, in Table 1, and at page 4, lines 15-17, and recitation of

the phrases "provokes an immune response when introduced into a subject," "immunogenic composition," or "method of inducing an immune response" in new claims 67-119 finds support, for example, at page 4, lines 23-25, and at pages 39-42, of the specification. Further, the fusion polypeptides claimed in new claims 87-119 find support, for example, at page 4, lines 13-15. No new matter has been added by these amendments.

Rejection under 35 U.S.C. § 112, first paragraph

Claim 1 and 52-55 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. In particular, the Office asserts (page 5, page 6):

> All of the B-moieties claimed are not required to evidence any specific biological activity, and no specific sites for the additional mutations ... The prior art teaches that each portion of anthrax toxin is not toxic by itself but must be combined with an additional portion in order for toxicity to be produced, therefore the recitation of the term "anthrax toxin" set forth in the claims, defines a starting material from which the B-moiety is derived. (citation omitted)
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> * * *
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> No specific distinguishing characteristics are set forth in the claims to show that the B-moieties are characteristic of anthrax toxin B-moieties.

Applicants submit that the present claim amendments overcome this basis for rejection.

Applicants have amended claims 1 and 52-55 to be directed to purified mutated B

moieties of an anthrax toxin. Further, these claims require the mutated B moiety to have inhibited pore-forming ability relative to a naturally-occurring B moiety of an anthrax toxin. Thus, the claims not only set forth a biological activity for the claimed anthrax toxin B moiety, but also clarify, as is set forth in the preamble of the claim, that the claims are directed to mutated anthrax toxin B moieties. Further, the claims require that the B moiety includes a sequence that is 95% identical to a given reference sequence. Applicants submit that this claim language should be read as requiring 95% sequence identity over the full length of the reference sequence. Thus, the sequences encompassed by the present claim cannot be 95% identical to "any size" fragment of the reference sequence as asserted by the Office. Instead, the claims are directed to any amino acid sequence that is 95% identical to the reference amino acid sequence over its full length, includes a particular mutation, and has a particular function.

In sum, the high percentage of identity recited in the claims, in combination with the functional requirement, clearly is sufficient to allow the skilled artisan to recognize the necessary common attributes or features of the purified mutated anthrax toxin B moieties encompassed by the present claims. Consequently, Applicants submit that the present claims meet the written description requirement of 35 U.S.C. § 112, first paragraph. This basis for rejection should be withdrawn.

With regard to new claims 65-119, Applicants note that these claims also are directed to sequences that are 95% identical to a given reference amino acid sequence,

have a particular mutation, and have a specific biological activity. Again, the percent identity requirement should be read as percent identity over the full length of the reference sequence. Thus, for the above reasons, these claims meet the written description standard.

Rejection under 35 U.S.C. § 112, second paragraph

Claims 1 and 52-55 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Office asserts (page 7):

> [T]he term "an" is an indefinite article, and does not set forth what the amino acid sequence [is] that evidences the recited percent identity with SEQ ID NO 8. The claimed moiety is not required to comprise the entire amino acid sequence of SEQ ID NO 8 ... but must only comprise, for example, position 425 lysine through the positive recitation of D425K.

Applicants disagree. The claims, as amended, encompass a mutated anthrax toxin B moiety that "comprises an amino acid sequence that is 95% identical to the sequence of" SEQ ID NO:8, 10, 11, 13, or 16. Applicants again note that this language clearly requires 95% identity over the full length of the reference sequence. Based on the claim language, Applicants submit that the sequences recited in the claims are not sequences that include only a single amino acid of the sequence of SEQ ID NO:8, 10, 11, 13, or 16, or short fragments of these sequences.

Claims 1 and 52-55 also require the mutated anthrax toxin B moiety to have inhibited pore-forming ability relative to a naturally-occurring B moiety of an anthrax

toxin and, therefore, also define the function of the claimed B moiety. In short, Applicants submit that claims 1 and 52-55 clearly describe the claimed invention and this basis of rejection should be withdrawn.

New claims 65-119, like claims 1 and 52-55, require a function for the polypeptides recited in the claims. These new claims further recite a particular percent identity to a reference sequence and require that the claimed sequence includes a particular mutation. Thus, Applicants submit that these new claims are free of the 35 U.S.C. § 112, second paragraph, rejection.

Rejection under 35 U.S.C. § 102

Claim 1 is rejected under 35 U.S.C. § 102(a) as being anticipated by Kim et al. (J. Biol. Chem. 275:6175-6180, 2000; "Kim"). The Office states (page 8):

> Kim et al. disclose a mutant moiety that comprises "D425K" ... and therefore comprises an amino acid sequence of at least 95% identity with SEQ ID NO 8, the sequence held in common being position 425, specifically D425K. The moiety of Kim et al comprising D425K, this sequence sharing 100% sequence identity with an amino acid sequence of SEQ ID NO 8.

This basis for rejection should be withdrawn.

For a reference to anticipate a claim, the reference must teach every feature of that claim. Applicants note that Kim teaches a rat vesicular acetylcholine transporter with a D425K mutation. Claim 1, as amended, requires that the purified mutated anthrax toxin

B moiety includes an amino acid sequence that is 95% identical to the sequence of SEQ ID NO:8 and also includes a D425K mutation. Kim does not teach an anthrax toxin B moiety, much less one that is 95% identical to the sequence of SEQ ID NO:8 (over its full length). Thus, Kim cannot anticipate claim 1. As Kim does not teach the sequences recited in claims 65-119, Applicants submit that these claims also are free of 35 U.S.C. § 102 rejection over this reference.

CONCLUSION

Applicants submit that the application is now in condition for allowance and this action is hereby respectfully requested.

Enclosed are a Petition to extend the period for replying to the Office Action for two months, to and including October 26, 2004, and a check in payment of the required extension fee.

Also enclosed is a check in the amount of $772.00 for excess claims fees. If there are any additional charges or any credits, please apply them to Deposit Account No. 03-2095.

Respectfully submitted,

Date: October 26, 2004

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